



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

VOL. XIII.

PART I.

JOURNAL

OF THE

INSTITUTE OF ACTUARIES.

NO. LXIII.

APRIL, 1866.

LONDON :

CHARLES AND EDWIN LAYTON, 150, FLEET STREET;

DEPOT FOR BOOKS ON ASSURANCE—LIFE, FIRE, & MARINE.

EDINBURGH: JOHN GRANT. NEW YORK: H. BAILLIÈRE, 290, BROADWAY.

PARIS: J. B. BAILLIÈRE, LIBRAIRE, RUE HAUTEFEUILLE.

HAMBURG: W. MAUKE SÖHNE.

PRINTED BY C. & E. LAYTON, 150, FLEET STREET,
TO WHOM ALL COMMUNICATIONS FOR THE EDITOR SHOULD BE SENT, POST PAID.

Price 2s.

INSTITUTE OF ACTUARIES.

President.

CHARLES JELLICOE.

Vice-Presidents.

SAMUEL BROWN.
WILLIAM BARWICK HODGE

THOMAS BOND SPRAGUE, M.A.
W. S. B. WOOLHOUSE, F.R.A.S.

Fellows.

ARTHUR HUTCHESON BAILEY.
SAMUEL BROWN.
CHARLES JOHN BUNYON, M.A.
DAVID CHISHOLM.
GEORGE CUTCLIFFE.
HENRY DEVEREUX DAVENPORT.
ARCHIBALD DAY.
PERCY MATTHEW DOVE.
WILLIAM EMMENS.
JOHN FRASER.
EDWIN HENRY GALSWORTHY.
WILLIAM BARWICK HODGE.
CHARLES JELLICOE.
SAMUEL LINN LAUNDY.
JOHN LAURENCE.

CHARLES TERRELL LEWIS.
JEREMIAH LODGE, B.A.
HENRY MARSHALL.
JAMES MEIKLE.
JOHN MESSENT.
ARTHUR PEARSON.
WILLIAM RATRAY.
JOHN REDDISH.
FREDERICK GARLE SMITH.
HENRY AMBROSE SMITH.
WILLIAM SPENS.
THOMAS BOND SPRAGUE, M.A., F.S.S.
ROBERT TUCKER.
JOHN HILL WILLIAMS, F.S.S.
W. S. B. WOOLHOUSE, F.R.A.S.

The above constitute the Council for the current year.

MARCUS N. ADLER, M.A.
JOHN BULLER ALLAN.
JOHN BARCLAY BANNERMAN.
EDWARD WILLIAM BRABROOK, F.S.A.
WILLIAM MEREDITH BROWNE.
ALEXANDER BURNETT, F.S.S.
EDWARD BUTLER.
THOMAS CARR.
CHARLES BUSH CLABON.
WILLIAM PALIN CLIREHUGH.
JOHN COLES, F.S.S.
JOHN ROSE CORMACK, M.D., F.R.S.E.
JOHN CRAIG.
JOSEPH STEVENS CUDLIP.
FRANK ALLAN CURTIS.
PHILIP CURTIS.
EDWARD CUTBUSH.
THOMAS GOLDIE DICKSON.
JOHN HARRY EVENS.
ALEXANDER GLEN FINLAISON.
ALEXANDER JOHN FINLAISON.
ALEXANDER P. FLETCHER.
JAMES E. GALE.
WILLIAM SUTTON GOVER.
WILLIAM JOHN HANCOCK.
HENRY HARBEN.
H. S. HAWKINS.
AUGUSTUS HENDRIKS.
JENKIN JONES.
WILLIAM KING.
CLAUDE GEORGE LAING.
CHARLES LUCIUS LAWSON.
EDWIN LENDON.

JOHN ELPHICK LEYLAND, F.S.S.
WILLIAM THOMAS LINFORD.
ROBERT JOHN LODGE.
WILLIAM MATTHEW MAKEHAM.
JOSIAH MARTIN.
FRANK M'GEDY.
DONALD MACGILLIVRAY.
THOMAS MILLER.
WILLIAM LEWIN NEWMAN.
WILLIAM NEWMARCH, F.R.S.
EDWARD A. NEWTON, M.A.
WILLIAM POLLARD PATTISON.
GEORGE HENRY PINCKARD.
HENRY WILLIAM PORTER, B.A.
ALEXANDER GILLESPIE RAMSAY.
WILLIAM BRIDGES ROW, B.A.
PHILIP SCOOSES.
EBENEZER ERSKINE SCOTT.
GEORGE SCOTT.
HENRY WILLIAM SMITH.
COLONEL JOHN THOMAS SMITH.
WILLIAM SMITH.
GEORGE STEWART.
JOHN STOTT.
JAMES TERRY.
JAMES MICHAEL TERRY.
ROBERT THOMSON.
JOSEPH TODHUNTER.
THOMAS WALKER, B.A.
JAMES M. WILSON.
ROBERT WILSON.
SAMUEL YOUNGER.

Honorary Secretaries.

ARCHIBALD DAY. | JOHN HILL WILLIAMS.

Auditors.

GEORGE WILLIAM BERRIDGE. | RALPH PRICE HARDY.
BENJAMIN NEWBATT.

Assistant Secretary.

FREDERICK GOVER.

Clerk.

WILLIAM FREDERICK PURDY.

[ENTERED AT STATIONERS' HALL.]

JOURNAL

OF THE

INSTITUTE OF ACTUARIES.

VOL. XIII.—PART I.

APRIL, 1866.

LONDON:
CHARLES AND EDWIN LAYTON,
150, FLEET STREET.

EDINBURGH: JOHN GRANT. NEW YORK: H. BAILLIERE, 290, BROADWAY.
PARIS: J. B. BAILLIERE, LIBRAIRE, RUE HAUTEFEUILLE.
HAMBURG: PERTHES, BESSER, & MAUKE.

[The Council of the Institute of Actuaries of Great Britain and Ireland wish it to be understood, that while they consider it their duty to give, from time to time, publicity to certain of the papers presented to the Institute, they do not hold themselves responsible for the opinions put forward therein.]

LONDON :
PRINTED BY CHARLES AND EDWIN LAYTON,
150, FLEET STREET; AND 12, GOUGH SQUARE.

CONTENTS OF NO. LXIII.

	PAGE
Memoir of the late Benjamin Gompertz, F.R.S., F.R.A.S., &c.. By Marcus N. Adler, M.A., Fellow of the Institute of Actuaries and of the Statistical Society	1
On the Limitation of Risks; being an Essay towards the Determination of the Maximum Amount of Risk to be retained by a Life Assurance Company on a Single Contingency. By Thomas Bond Sprague, M.A., Vice-President of the Institute of Actuaries	20
General Average. By Richard Morrison (continued from p. 361, vol. xii.)	39
A Budget of Paradoxes. By Professor De Morgan (continued from p. 301, vol. xii.)	51
CORRESPONDENCE:—	
Letter from Mr. Samuel Younger on the Value of Options in certain Contracts	55
,, Mr. H. Ambrose Smith on the late Mr. Finlaison's Tables	58
,, Mr. Peter Gray on the Comparative Merits of the old and new Methods of Solution	60

NOTICE TO CORRESPONDENTS.

Communications for this *Journal* must be sent in at least one month prior to the day of publication, or their insertion will in all probability be deferred.

THE
ASSURANCE MAGAZINE
AND
JOURNAL
OF THE
INSTITUTE OF ACTUARIES.

VOL. XIII.

LONDON:
CHARLES & EDWIN LAYTON, 150, FLEET STREET.
EDINBURGH: JOHN GRANT. NEW YORK: H. BAILLIÈRE, 290, BROADWAY.
PARIS: J. B. BAILLIÈRE, LIBRAIRE, RUE HAUTEFEUILLE.
HAMBURG: PERTHES, BESSER, & MAUKE.

1867.

[ENTERED AT STATIONERS' HALL.]

LONDON:
PRINTED BY CHARLES AND EDWIN LAYTON,
150, FLEET STREET, & 12, GOUGH SQUARE.

C O N T E N T S O F V O L . X I I I .

	<small>PAGE</small>
Memoir of the late Benjamin Gompertz, F.R.S., F.R.A.S., &c. By Marcus N. Adler, M.A., Fellow of the Institute of Actuaries and of the Statistical Society	1
On the Limitation of Risks; being an Essay towards the Determination of the Maximum Amount of Risk to be retained by a Life Assurance Company on a Single Contingency. By Thomas Bond Sprague, M.A., Vice-President of the Institute of Actuaries	20
General Average. By Richard Morrison	39, 161
A Budget of Paradoxes. By Professor De Morgan	51, 176, 231
On the Construction of Tables by the Method of Differences. By Peter Gray, F.R.A.S., Honorary Member of the Institute of Actuaries	61, 149, 293
On the Construction of Tables of Mortality. By W. S. B. Woolhouse, F.R.A.S., F.S.S., Vice-President of the Institute of Actuaries, &c.	75
On the Calculation of Life Contingencies. (Part II.) By Professor De Morgan..	129
On the Value of Annuities payable Half-yearly, Quarterly, &c. By T. B. Sprague, M.A., Actuary of the Equity and Law Life Assurance Society.....	188, 201, 305
On Annuities and Assurances on Successive Lives. By Thomas Weddle, F.R.A.S.	221
Eighth Census of the United States, in 1860. By Samuel Brown, V.P.S.S.	226
On the Arrangement of the Data furnished by certain Life Assurance Companies in Scotland, and on the formation of Tables, &c., therefrom; being Contributions towards the ascertainment of the Rate of Mortality of Assured Lives. By James Meikle, Esq., Actuary of the Scottish Provident Institution	261
On the Mortality in the United States of America, as deduced from the last Census, in 1860. By Samuel Brown, V.P.S.S., Vice-President of the Institute of Actuaries	272

	<small>PAGE</small>
On the Law of Mortality. By William Matthew Makeham, Fellow of the Institute of Actuaries	325
On the Value of Apportionable Annuities; or of Annuities in which a proportionate part is payable up to the day of death. By T. B. Sprague, M.A., Actuary of the Equity and Law Life Assurance Society, and Vice-President of the Institute of Actuaries	358

CORRESPONDENCE:—

Letter from Mr. Samuel Younger on the Value of Options in certain Contracts	55
,, Mr. H. Ambrose Smith on the late Mr. Finlaison's Tables	58
,, Mr. Peter Gray on the Comparative Merits of the old and new Methods of Solution	60
,, Mr. H. Ambrose Smith on Mr. Stephenson's Letter on the Value of Options	103
,, Mr. Peter Gray on the Value of Options in certain Contracts	104
,, Mr. W. M. Makeham on Mr. Younger's Letter, and on the General Solution of Problems involving distinct Contingencies	109
,, Mr. J. W. Stephenson on the Tables of Deferred Annuities as published by the Government.....	114
,, Mr. Samuel Younger on the Value of Options in certain Contracts	118
,, Mr. W. S. B. Woolhouse on the Formula for Quadratures	119
,, Mr. James R. Macfadyen on certain Formulae in Mr. David Jones's Work on Annuities, &c.	200
,, T. M. on the Conversion of ordinary Assurances for the Whole Term of Life into Endowment ones by Application of Bonus ..	246
,, Mr. Wilhelm Lazarus on new Tables of Annuities, &c., by Dr. Otto Beeck, of Halle	251
,, Mr. Colin McCuaig on the Formulae in Mr. David Jones's Work, commented on by Mr. Macfadyen.....	251
,, Mr. T. B. Sprague on the phrase "Expectation of Life"	381

INSTITUTE OF ACTUARIES:—

Proceedings of the Institute	120, 252, 384
Annual General Meetings	122, 385

Contents of Vol. XIII.

v

INSTITUTE OF ACTUARIES (continued) :—

	PAGE
Annual Reports.....	122, 385
Reports from Assistant Secretary	123, 386
Abstracts of Receipts and Payments for the Years ended 31st March, 1866, and 31st March, 1867	125, 396
Solutions of the Second Year's Examination Questions.....	253
The President's Address	391